TOSHIBA

LIQUID CRYSTAL DISPLAY DIVISION
PRODUCT INFORMATION

FEATURES

    (1) 18.1"SXGA display size for LCD Monitor
    (2) LVDS interface system
    (3) With inverter

TENTATIVE

MECHANICAL SPECIFICATIONS

Item	Specifications
Dimensional Outline (typ.)	389.0(W) x 317.2(H) x 34.0 typ.(D) mm
Number of Pixels	1280(W) x 1024(H) pixels
Active Area	359.0(W) x 287.2(H) mm
Pixel Pitch	0.2805(W) x 0.2805(H)
Weight (approximately)	3,300 g
Backlight	Sidelight type, Six Lamps

ABSOLUTE MAXIMUM RATINGS

Item		Min.	Max.	Unit
Logic Supply Voltage	(V_{DD})	-0.3	13.2	V
Inverter Supply Voltage	(V_{INV})	-0.3	13.2	V
Input Signal Voltage	(V_{IN})	-0.3	3.3	V
Operating Temperature		0	50	°C
Storage Temperature		-20	60	°C
Storage Humidity		10	90	%RH

ELECTRICAL SPECIFICATION

Item		Min.	Typ.	Max.	Unit	Remarks
Logic Supply Voltage	(V_{DD})	11.4	12	12.6	V	
Inverter Supply Voltage	(V_{INV})	11.4	12	12.6	V	
Differential Input High Threshold(V_{TH})		1	---	1	V	
Differential Input High Threshold(V_{TL})		1	---	1	V	
Current Consumption	(I_{DD})	---	670	840	mA	
	(I_{INV})	---	3.0	3.3	A	
Power Consumption	Logic	---	8	10	W	V_{in}=12V
	Inverter	---	36	40	W	V_{in}=12V

    *1 : Refer to LVDS specifications of SN75LVDS82(Receiver)/SN75LVDS83 by Texas Instruments Corporation.

OPTICAL SPECIFICATION (Ta=25°C)

Item		Min.	Typ.	Max.	Unit	Remarks
Contrast Ratio (CR)			300	---	---	
Response Time	(T_r)	---	30	---	ms	(10% to 90%)
	(T_d)	---	30	---	ms	(10% to 90%)
Luminance (L)		---	(23.5)	(47.0)	cd/m²	V_{DIM} = 4V *2
		---	(235)	---	cd/m²	V_{DIM} = 0V *2

    *2 : V_{DIM} : Backlight control voltage (from 0V to 4V)
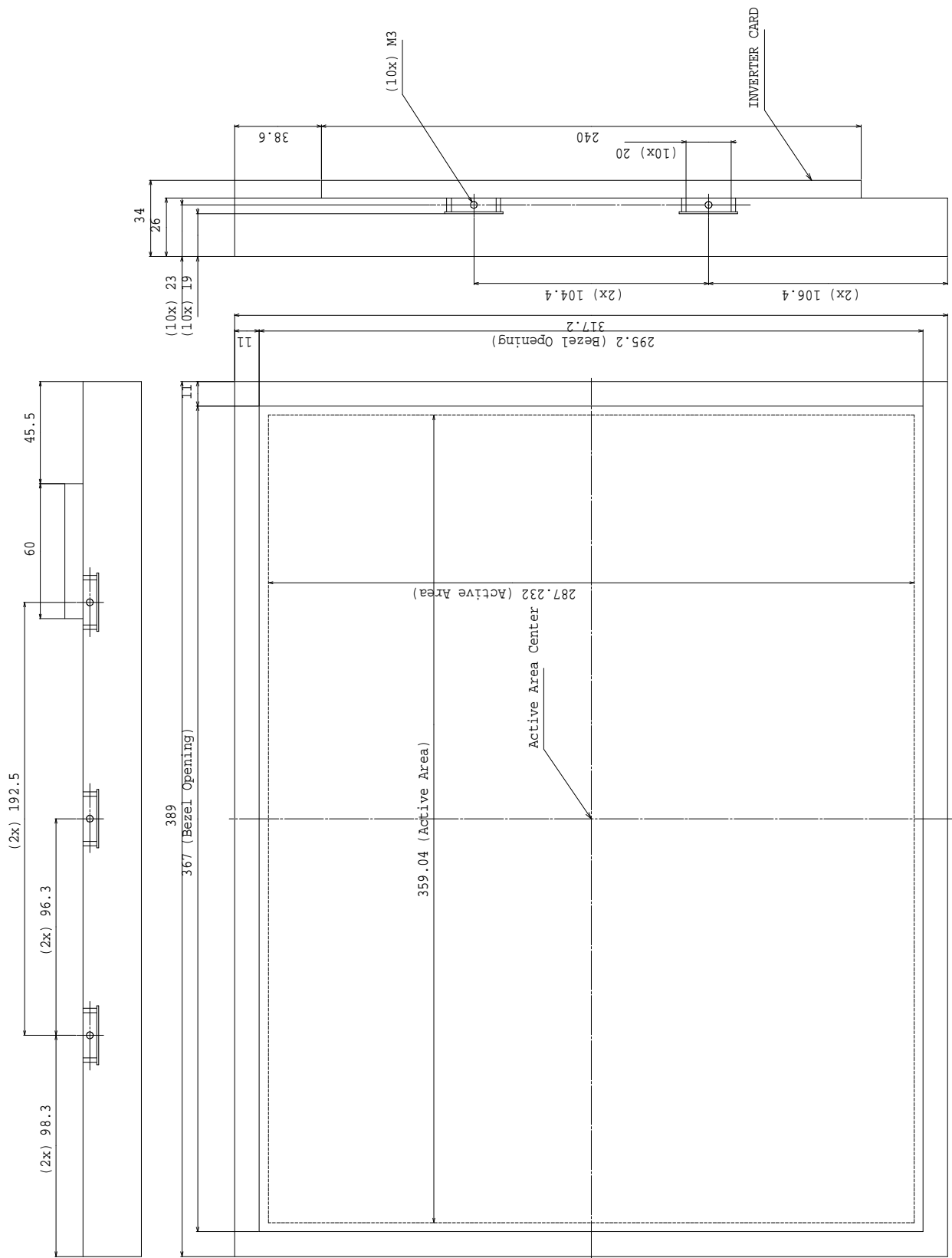
        V_{DIM} = 0V : Brightness MAX.

        V_{DIM} = 4V : Brightness MIN.

1999-4-26(Ver.0.3)

DIMENSIONAL OUTLINE (FRONT)

Unit : mm
Standard tolerance : 0.6

(2/17)

1999-4-26(Ver.0.3)

DIMENSINAL OUTLINE (REAR)

Unit : mm
Standard tolerance : 0.6

FRONT SURFACE OF BEZEL

SECTION A-A

2.4

(10x) 1

(2x) 224

(3x) 138

(8x) 6.5

(8x) M2.5

(3x) 37.5

(8x) 6.5

(2x) 28.3

13.3

114

86.7

156.7

(2x) 228

A

A

(3/17)

1999-4-26(Ver.0.3)

BLOCK DIAGRAM

1999-4-26(Ver.0.3)

PIXEL FORMAT

	1280 Pixels						1024 Lines
	EVEN	ODD		EVEN	ODD		ODD
	0,0	1,0		x_{2n},0	x_{2n-1}, 0		1279, 0
Display	0,y			x_{2n},y	x_{2n-1}, y		
	0, 1023						1279, 1023
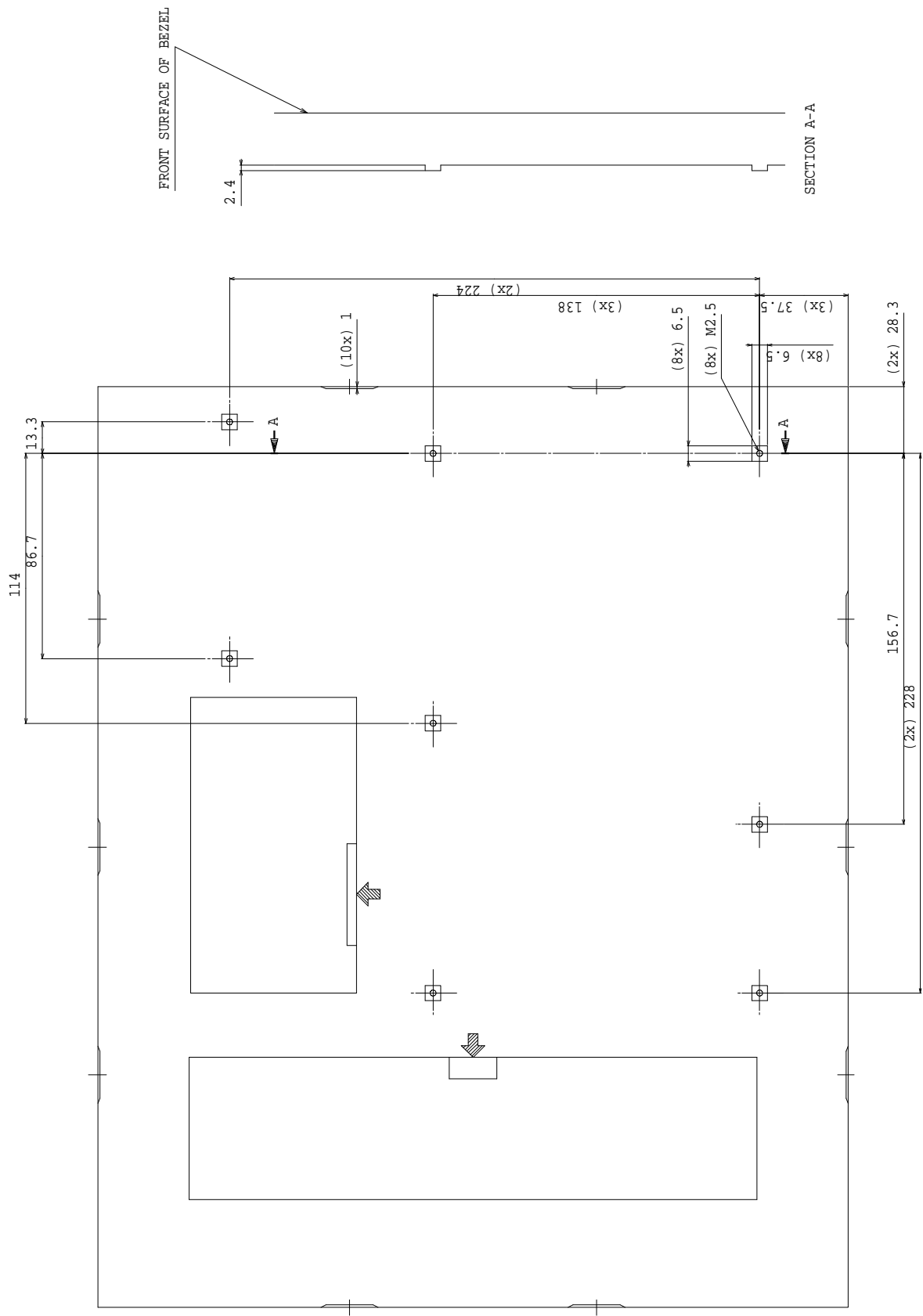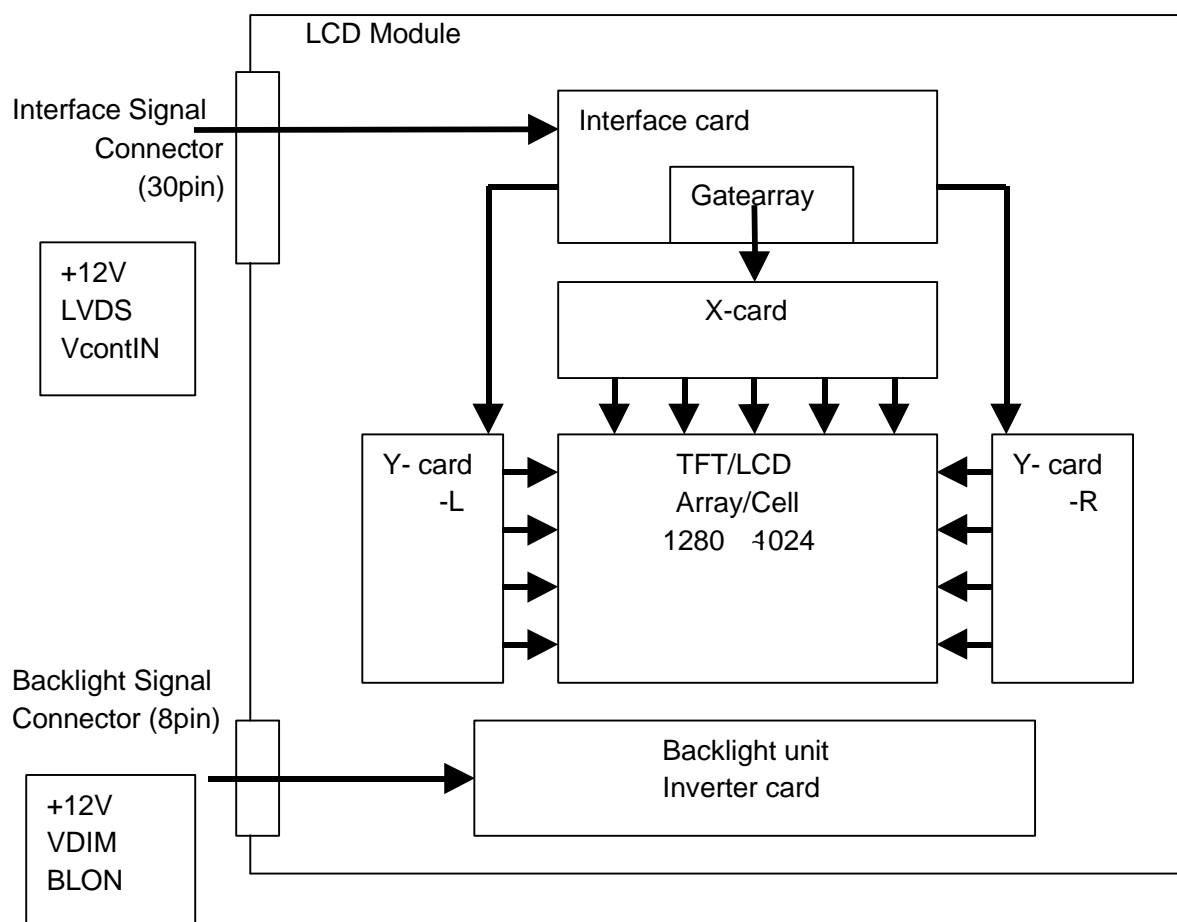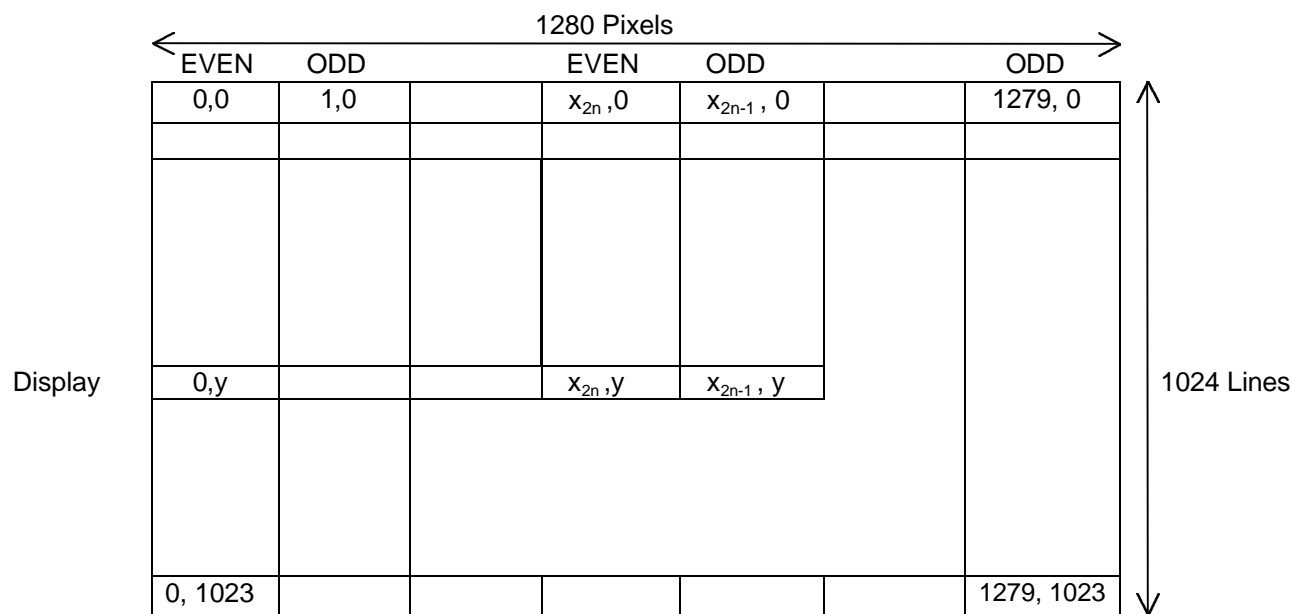
TIMING CHART

(1) Vsync, Hsync and Display Timing

Vsync
Hsync
DSPTMG

Tv
Tvf
Tva
Tvb
Th
Tha

1 2 3 m
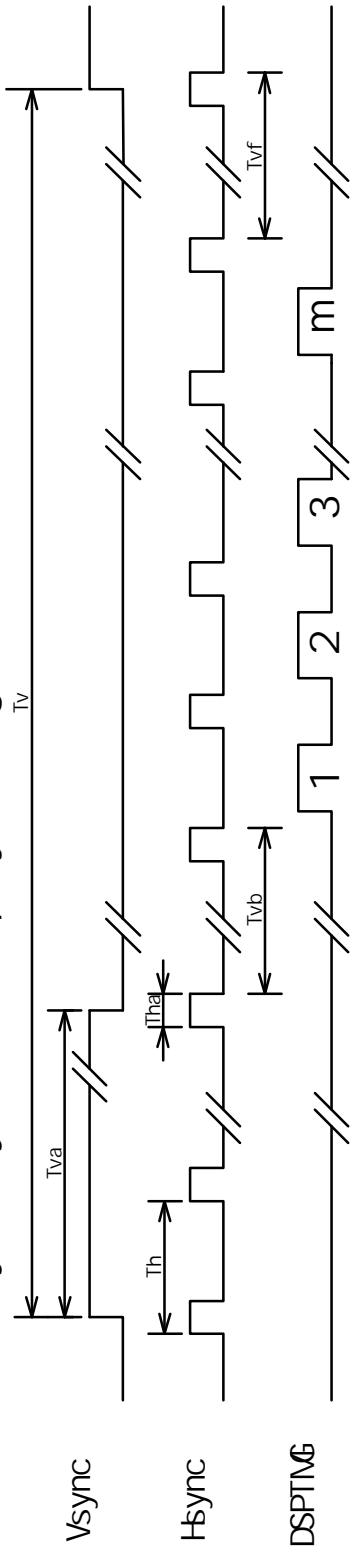
(2) Video signal and Dot clock

VIDEO(EVEN)
VIDEO(ODD)
DOTCLK
DSPTMG
Hsync

Thd
Tck
Tds
Tdh
Thf
Thb
Tha

0 2 n-4 n-2
1 3 n-3 n-1

1999-4-26(Ver.0.3)
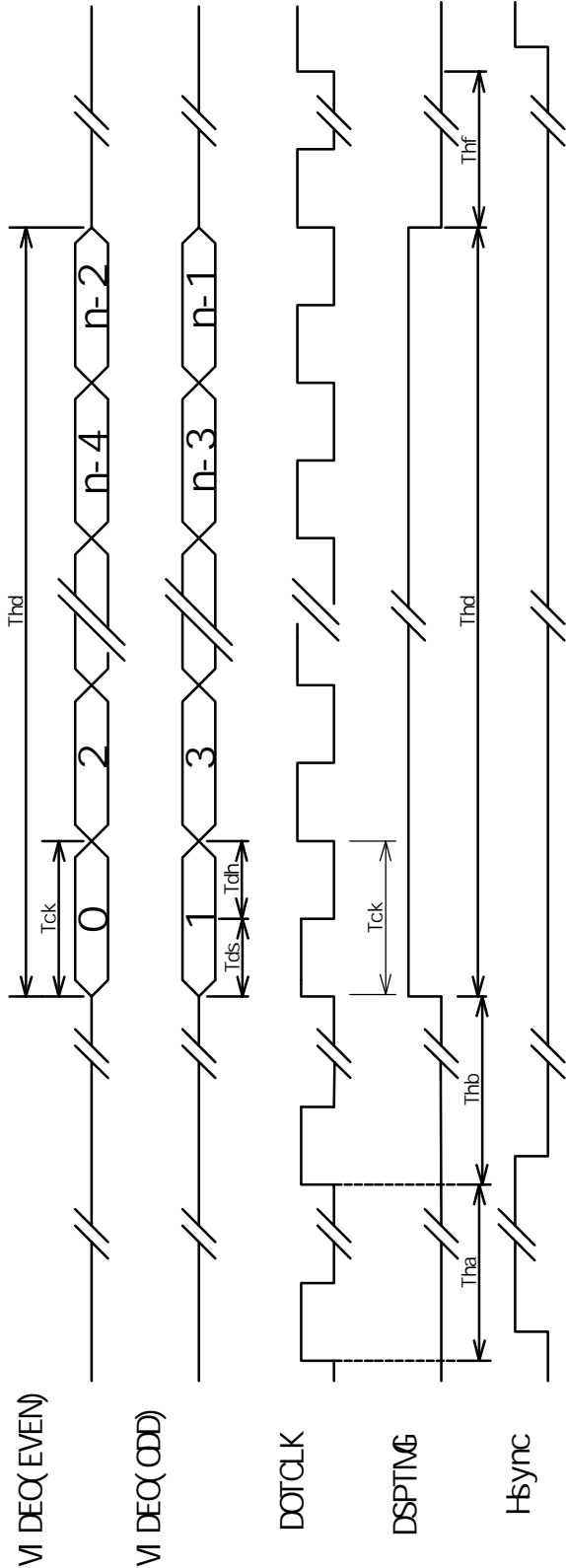
TIMING SPECIFICATION

Item	Symbol	Min.	Typ.	Max.	unit	Remarks
Clock Frequency	Fdck	50	54	56.8	MHz	
Clock Period	Tck	17.6	18.5	20	ns	
Frame Rate	1/Tv	56.25	60.02	61.0	Hz	
Frame Period	Tv	16.39	16.66	17.78	ms	
V-Sync Active Level	Tva	Tv x 3	Tv x 3	---	ms	
V-Back Porch	Tvb	Tv x 7	Tv x 38	Tv x 63	ms	
V-Front Porch	Tvf	Tv x 1		---	ms	
V-Line	m	---	Tv x 1024	---	Ms	
Scan Rate	1/Th	---	63.98	---	kHz	
H-Sync Active Level	Tha(*1)	Tck x 4	Tck x 56	---	ns	
H-Back Porch	Thb(*1)	Tck x 4	Tck x 124	---	ns	
H-Front Porch	Thf	Tck x 4	Tck x 24	---	ns	
Display Pixels	n	---	Tck x 640	---	ns	

Note: The typical values conform to VESA STANDARD.

(*1) : Tha+Thb should be less than 1024 Tc.

CONNECTOR PIN ASSIGNMENT FOR INTERFACE

INPUT SIGNAL

The module uses a pair of LVDS receiver SN75LVDS82(Texas Instruments) or compatible. LVDS is a differential signal technology for LCD interface and high speed data transfer device. Transfer shall be SN75LVDS83 (negative edge sampling) or compatible.

Connector : FI-SE30P-HF or FI-S30P-HF / JAE.

Mating Connector :FI-S30S / JAE.

Terminal No.	Symbol	Function
1	VDD	Power Supply : +12.0V
2	VDD	Power Supply : +12.0V
3	VDD	Power Supply : +12.0V
4	GND	Gnd for VDD line
5	GND	Gnd for VDD line
6	GND	Gnd for VDD line
7	SELLVDS	Select LVDS data order. See the following figure.
8	VcontIN	Contrast signal voltage input(0-3V). Need to input stable voltage.(*1)
9	DGND	Digital Ground for VcontIN
10	RxOIN3+	Positive Transmission Clock (Odd data)
11	RxOIN3-	Negative Transmission Clock (Odd data)
12	RxOCK+	Positive Transmission Data (Odd Clock)
13	RxOCK-	Negative Transmission Data (Odd Clock)
14	RxOIN2+	Positive Transmission Data (Odd data)
15	RxOIN2-	Negative Transmission Data (Odd data)
16	RxOIN1+	Positive Transmission Data (Odd data)
17	RxOIN1-	Negative Transmission Data (Odd data)
18	RxOIN0+	Positive Transmission Data (Odd data)
19	RxOIN0-	Negative Transmission Data (Odd data)
20	RXEIN3+	Positive Transmission Clock (Even data)
21	RxEIN3-	Negative Transmission Clock (Even data)
22	RxECK+	Positive Transmission Data (Even Clock)
23	RxECK-	Negative Transmission Data (Even Clock)
24	RxEIN2+	Positive Transmission Data (Even data)
25	RxEIN2-	Negative Transmission Data (Even data)
26	RxEIN1+	Positive Transmission Data (Even data)
27	RxEIN1-	Negative Transmission Data (Even data)
28	RxEIN0+	Positive Transmission Data (Even data)
29	RxEIN0-	Negative Transmission Data (Even data)
30	LVDSGND	Ground for LVDS Clock/Data signals

Note : Input signals of odd and even clock shall be the same timing.

(*1) 1.5V is the center of the design point.

The Gamma curve of the gray level(Level1 to Level254) will be bent towards,

0V : White side   ,3V : Black side

The maximum white(Level255) and black (Level0) luminance will not change.

Backlight Signal Connector

Connector : S8B-PH-SM3 / JST.

Mating Connector : PHR-8 / JST.

Terminal No.	Symbol	Function
1	VBL	+12V Power Supply for backlight
2	VBL	+12V Power Supply for backlight
3	VBL	+12V Power Supply for backlight
4	GND	Ground for VBL line, VDIM and BLON
5	GND	Ground for VBL line, VDIM and BLON
6	GND	Ground for VBL line, VDIM and BLON
7	VDIM	Backlight Control Voltage Input(0-4V) 0V:Brightness MAX, 4V:Brightness MIN
8	BLON	Backlight on/off signal (H : Backlight ON, L : Backlight OFF) TTL Level

1999-4-26(Ver.0.3)
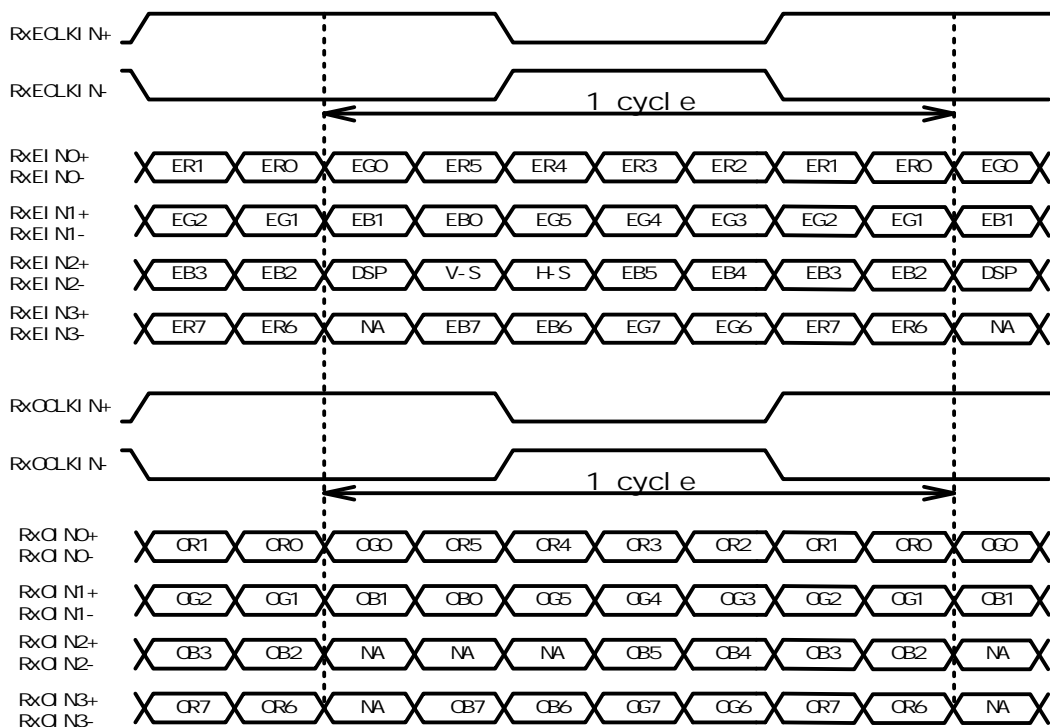
SELLVDS=Low or Open

Note : R/G/B Data7:MSB , R/G/B Data0:LSB

SELLVDS=High

Note : R/G/B Data7:MSB , R/G/B Data0:LSB

(10/17)
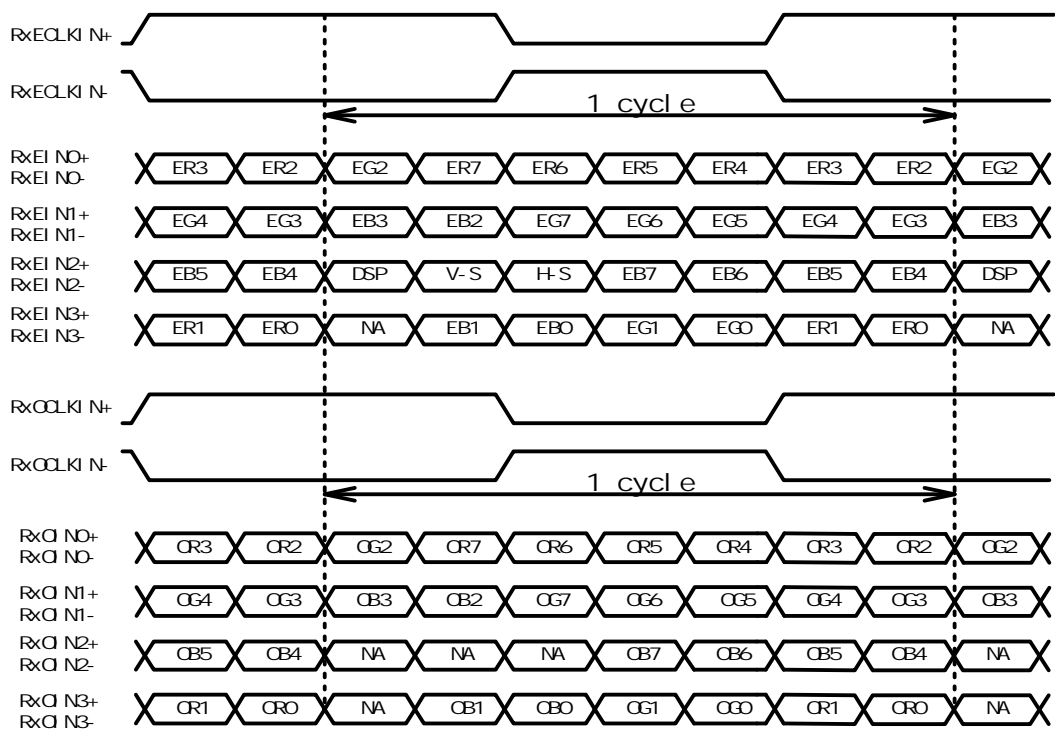
Recommended Transmitter (SN75LVDS83DGG) to LTM18C161S Interface Assignment
SELLVDS = Low or Open

T1(Odd Pixels Data) Signal Interface : Transmitter(SN75LVDS83DGG)					
Input Terminal		Input Signal(Graphics controller output signal)		Output Signal Symbol	To LTM18C161 Interface Terminal:Symbol
Number	Symbol	Symbol	Function		
51	T1IN0	RO0	RED Odd pixels DISPLAY DATA (LSB)	T1OUT0- T1OUT0+	No.18 No.19
52	T1IN1	RO1	RED Odd pixels DISPLAY DATA		
54	T1IN2	RO2	RED Odd pixels DISPLAY DATA		
55	T1IN3	RO3	RED Odd pixels DISPLAY DATA		
56	T1IN4	RO4	RED Odd pixels DISPLAY DATA		
3	T1IN6	RO5	RED Odd pixels DISPLAY DATA		
4	T1IN7	GO0	GREEN Odd pixels DISPLAY DATA (LSB)		
6	T1IN8	GO1	GREEN Odd pixels DISPLAY DATA	T1OUT1- T1OUT1+	No.16 No.17
7	T1IN9	GO2	GREEN Odd pixels DISPLAY DATA		
11	T1IN12	GO3	GREEN Odd pixels DISPLAY DATA		
12	T1IN13	GO4	GREEN Odd pixels DISPLAY DATA		
14	T1IN14	GO5	GREEN Odd pixels DISPLAY DATA		
15	T1IN15	BO0	BLUE Odd pixels DISPLAY DATA (LSB)		
19	T1IN18	BO1	BLUE Odd pixels DISPLAY DATA		
20	T1IN19	BO2	BLUE Odd pixels DISPLAY DATA	T1OUT2- T1OUT2+	No.14 No.15
22	T1IN20	BO3	BLUE Odd pixels DISPLAY DATA		
23	T1IN21	BO4	BLUE Odd pixels DISPLAY DATA		
24	T1IN22	BO5	BLUE Odd pixels DISPLAY DATA		
27	T1IN24	NA			
28	T1IN25	NA			
30	T1IN26	NA			
50	T1IN27	RO6	RED Odd pixels DISPLAY DATA	T1OUT3- T1OUT3+	No.10 No.11
2	T1IN5	RO7	RED Odd pixels DISPLAY DATA (MSB)		
8	T1IN10	GO6	GREEN Odd pixels DISPLAY DATA		
10	T1IN11	GO7	GREEN Odd pixels DISPLAY DATA (MSB)		
16	T1IN16	BO6	BLUE Odd pixels DISPLAY DATA		
18	T1IN17	BO7	BLUE Odd pixels DISPLAY DATA (MSB)		
25	T1IN23	NA			
31	T1CLK IN	NCLK	DATA SAMPLING CLOCK	T1CLK OUT- T1CLK OUT+	No.12 No.13

1999-4-26(Ver.0.3)

T2(Even Pixels Data) Signal Interface : Transmitter(SN75LVDS83DGG)					
Input Terminal		Input Signal(Graphics controller output signal)		Output Signal	To LTM18C161
Number	Symbol	Symbol	Function	Symbol	Interface Terminal:Symbol
51	T2IN0	RE0	RED Even pixels DISPLAY DATA (LSB)	T2OUT0- T2OUT0+	No.28 No.29
52	T2IN1	RE1	RED Even pixels DISPLAY DATA		
54	T2IN2	RE2	RED Even pixels DISPLAY DATA		
55	T2IN3	RE3	RED Even pixels DISPLAY DATA		
56	T2IN4	RE4	RED Even pixels DISPLAY DATA		
3	T2IN6	RE5	RED Even pixels DISPLAY DATA		
4	T2IN7	GE0	GREEN Even pixels DISPLAY DATA (LSB)		
6	T2IN8	GE1	GREEN Even pixels DISPLAY DATA	T2OUT1- T2OUT1+	No.26 No.27
7	T2IN9	GE2	GREEN Even pixels DISPLAY DATA		
11	T2IN12	GE3	GREEN Even pixels DISPLAY DATA		
12	T2IN13	GE4	GREEN Even pixels DISPLAY DATA		
14	T2IN14	GE5	GREEN Even pixels DISPLAY DATA		
15	T2IN15	BE0	BLUE Even pixels DISPLAY DATA (LSB)		
19	T2IN18	BE1	BLUE Even pixels DISPLAY DATA		
20	T2IN19	BE2	BLUE Even pixels DISPLAY DATA	T2OUT2- T2OUT2+	No.24 No.25
22	T2IN20	BE3	BLUE Even pixels DISPLAY DATA		
23	T2IN21	BE4	BLUE Even pixels DISPLAY DATA		
24	T2IN22	BE5	BLUE Even pixels DISPLAY DATA		
27	T2IN24	H-S	H-sync		
28	T2IN25	V-S	V-sync		
30	T2IN26	DSP	DISPLAY TIMING		
50	T2IN27	RE6	RED Even pixels DISPLAY DATA	T2OUT3- T2OUT3+	No.20 No.21
2	T2IN5	RE7	RED Even pixels DISPLAY DATA (MSB)		
8	T2IN10	GE6	GREEN Even pixels DISPLAY DATA		
10	T2IN11	GE7	GREEN Even pixels DISPLAY DATA (MSB)		
16	T2IN16	BE6	BLUE Even pixels DISPLAY DATA		
18	T2IN17	BE7	BLUE Even pixels DISPLAY DATA (MSB)		
25	T2IN23	NA			
31	T2CLK IN	NCLK	DATA SAMPLING CLOCK	T2CLK OUT- T2CLK OUT+	No.22 No.23

1999-4-26(Ver.0.3)

SELLVDS=High

T1(Odd Pixels Data) Signal Interface : Transmitter(SN75LVDS83DGG)					
Input Terminal		Input Signal(Graphics controller output signal)		Output Signal Symbol	To LTM18C161 Interface Terminal:Symbol
Number	Symbol	Symbol	Function		
51	T1IN0	RO2	RED Odd pixels DISPLAY DATA	T1OUT0- T1OUT0+	No.18 No.19
52	T1IN1	RO3	RED Odd pixels DISPLAY DATA		
54	T1IN2	RO4	RED Odd pixels DISPLAY DATA		
55	T1IN3	RO5	RED Odd pixels DISPLAY DATA		
56	T1IN4	RO6	RED Odd pixels DISPLAY DATA		
3	T1IN6	RO7	RED Odd pixels DISPLAY DATA (MSB)		
4	T1IN7	GO2	GREEN Odd pixels DISPLAY DATA		
6	T1IN8	GO3	GREEN Odd pixels DISPLAY DATA	T1OUT1- T1OUT1+	No.16 No.17
7	T1IN9	GO4	GREEN Odd pixels DISPLAY DATA		
11	T1IN12	GO5	GREEN Odd pixels DISPLAY DATA		
12	T1IN13	GO6	GREEN Odd pixels DISPLAY DATA		
14	T1IN14	GO7	GREEN Odd pixels DISPLAY DATA (MSB)		
15	T1IN15	BO2	BLUE Odd pixels DISPLAY DATA		
19	T1IN18	BO3	BLUE Odd pixels DISPLAY DATA		
20	T1IN19	BO4	BLUE Odd pixels DISPLAY DATA	T1OUT2- T1OUT2+	No.14 No.15
22	T1IN20	BO5	BLUE Odd pixels DISPLAY DATA		
23	T1IN21	BO6	BLUE Odd pixels DISPLAY DATA		
24	T1IN22	BO7	BLUE Odd pixels DISPLAY DATA (MSB)		
27	T1IN24	NA			
28	T1IN25	NA			
30	T1IN26	NA			
50	T1IN27	RO0	RED Odd pixels DISPLAY DATA (LSB)	T1OUT3- T1OUT3+	No.10 No.11
2	T1IN5	RO1	RED Odd pixels DISPLAY DATA		
8	T1IN10	GO0	GREEN Odd pixels DISPLAY DATA (LSB)		
10	T1IN11	GO1	GREEN Odd pixels DISPLAY DATA		
16	T1IN16	BO0	BLUE Odd pixels DISPLAY DATA (LSB)		
18	T1IN17	BO1	BLUE Odd pixels DISPLAY DATA		
25	T1IN23	NA			
31	T1CLK IN	NCLK	DATA SAMPLING CLOCK	T1CLK OUT- T1CLK OUT+	No.12 No.13

1999-4-26(Ver.0.3)

T2(Even Pixels Data) Signal Interface : Transmitter(SN75LVDS83DGG)					
Input Terminal		Input Signal(Graphics controller output signal)		Output Signal	To LTM18C161S
Number	Symbol	Symbol	Function	Symbol	Interface Terminal:Symbol
51	T2IN0	RE2	RED Even pixels DISPLAY DATA	T2OUT0- T2OUT0+	No.28 No.29
52	T2IN1	RE3	RED Even pixels DISPLAY DATA		
54	T2IN2	RE4	RED Even pixels DISPLAY DATA		
55	T2IN3	RE5	RED Even pixels DISPLAY DATA		
56	T2IN4	RE6	RED Even pixels DISPLAY DATA		
3	T2IN6	RE7	RED Even pixels DISPLAY DATA (MSB)		
4	T2IN7	GE2	GREEN Even pixels DISPLAY DATA		
6	T2IN8	GE3	GREEN Even pixels DISPLAY DATA	T2OUT1- T2OUT1+	No.26 No.27
7	T2IN9	GE4	GREEN Even pixels DISPLAY DATA		
11	T2IN12	GE5	GREEN Evenpixels DISPLAY DATA		
12	T2IN13	GE6	GREEN Even pixels DISPLAY DATA		
14	T2IN14	GE7	GREEN Even pixels DISPLAY DATA (MSB)		
15	T2IN15	BE2	BLUE Even pixels DISPLAY DATA		
19	T2IN18	BE3	BLUE Even pixels DISPLAY DATA		
20	T2IN19	BE4	BLUE Even pixels DISPLAY DATA	T2OUT2- T2OUT2+	No.24 No.25
22	T2IN20	BE5	BLUE Even pixels DISPLAY DATA		
23	T2IN21	BE6	BLUE Even pixels DISPLAY DATA		
24	T2IN22	BE7	BLUE Even pixels DISPLAY DATA (MSB)		
27	T2IN24	H-S	H-sync		
28	T2IN25	V-S	V-sync		
30	T2IN26	DSP	DISPLAY TIMING		
50	T2IN27	RE0	RED Even pixels DISPLAY DATA (LSB)	T2OUT3- T2OUT3+	No.20 No.21
2	T2IN5	RE1	RED Even pixels DISPLAY DATA		
8	T2IN10	GE0	GREEN Even pixels DISPLAY DATA (LSB)		
10	T2IN11	GE1	GREEN Even pixels DISPLAY DATA		
16	T2IN16	BE0	BLUE Even pixels DISPLAY DATA (LSB)		
18	T2IN17	BE1	BLUE Even pixels DISPLAY DATA		
25	T2IN23	NA			
31	T2CLK IN	NCLK	DATA SAMPLING CLOCK	T2CLK OUT- T2CLK OUT+	No.22 No.23

The following is LVDS Signal description.

LVDS Data Name	Description	
DSP	Display Timing	When the signal is high, the pixel data shall be valid to be displayed.
V-S	Vertical Sync	Both Positive and negative polarities are acceptable.
H-S	Horizontal Sync	Both Positive and negative polarities are acceptable.

Note: Output signals from any system shall be low or Hi-Z state when VDD is off.

1999-4-26(Ver.0.3)

Interface Signal Electrical Characteristics

Input signal shall be low or Hi-Z state when VDD is off.

It is recommended to refer the specifications of SN75LVDS82DGG (Texas Instruments) in detail.

Signal electrical characteristics are as follows.

Symbol	Condition	Min.	Max	unit
Vth	Differential Input High Voltage (Vcom=+1.2V)		100	mV
Vtl	Differential Input High Voltage (Vcom=+1.2V)	-100		mV
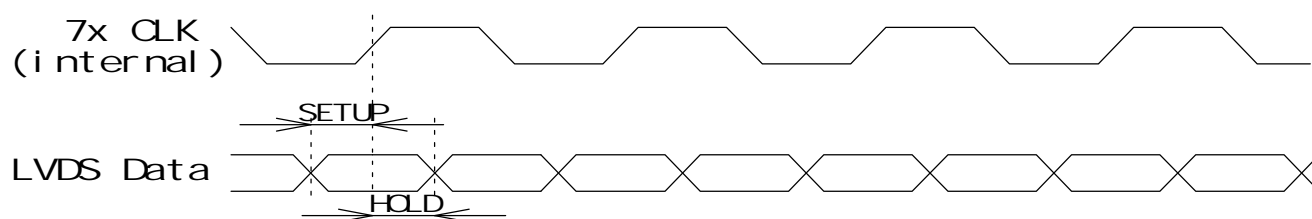
Name	Description	Min.	Typ.	Max.	unit
LVDS Data	SETUP Time	800	-	-	ps
	HOLD Time	800	-	-	ps

Name	Description	Min.	Typ.	Max.	unit	Note
SELLVDS	High Voltage	2	3	3.3	V	
	Low Voltage	-0.1	0	0.7	V	
	Current	-1		-	mA	
VcontIN	Input Voltage range	0		3	V	0V : towards white side 3V : towards black side
	Current	-1		1	mA	

1999-4-26(Ver.0.3)

256k (k=1024) COLORS COMBINATION TABLE

	Display	R7 R6 R5 R4 R3 R2 R1 R0	G7 G6 G5 G4 G3 G2 G1 G0	B7 B6 B5 B4 B3 B2 B1 B0	Gray Scale Level
Basic Color	Black	L L L L L L L L	L L L L L L L L	L L L L L L L L	-
	Blue	L L L L L L L L	L L L L L L L L	H H H H H H H H	-
	Green	L L L L L L L L	H H H H H H H H	L L L L L L L L	-
	Light Blue	L L L L L L L L	H H H H H H H H	H H H H H H H H	-
	Red	H H H H H H H H	L L L L L L L L	L L L L L L L L	-
	Purple	H H H H H H H H	L L L L L L L L	H H H H H H H H	-
	Yellow	H H H H H H H H	H H H H H H H H	L L L L L L L L	-
	White	H H H H H H H H	H H H H H H H H	H H H H H H H H	-
Gray Scale of Red	Black	L L L L L L L L	L L L L L L L L	L L L L L L L L	L 0
	Dark ↑ ↓ Light	L L L L L L L H	L L L L L L L L	L L L L L L L L	L 1
		L L L L L L H L	L L L L L L L L	L L L L L L L L	L 2
		L L L L L L H H	L L L L L L L L	L L L L L L L L	L 3
		L L L L L H L L	L L L L L L L L	L L L L L L L L	L 4
		:	:	:	L5… L252
		H H H H H H L H	L L L L L L L L	L L L L L L L L	L253
		H H H H H H H L	L L L L L L L L	L L L L L L L L	L254
	Red	H H H H H H H H	L L L L L L L L	L L L L L L L L	Red L255
Gray Scale of Green	Black	L L L L L L L L	L L L L L L L L	L L L L L L L L	L 0
	Dark ↑ ↓ Light	L L L L L L L L	L L L L L L L H	L L L L L L L L	L 1
		L L L L L L L L	L L L L L L H L	L L L L L L L L	L 2
		L L L L L L L L	L L L L L L H H	L L L L L L L L	L 3
		L L L L L L L L	L L L L L H L L	L L L L L L L L	L 4
		:	:	:	L5… L252
		L L L L L L L L	H H H H H H L H	L L L L L L L L	L253
		L L L L L L L L	H H H H H H H L	L L L L L L L L	L254
	Green	L L L L L L L L	H H H H H H H H	L L L L L L L L	Green L255
Gray Scale of Blue	Black	L L L L L L L L	L L L L L L L L	L L L L L L L L	L 0
	Dark ↑ ↓ Light	L L L L L L L L	L L L L L L L L	L L L L L L L H	L 1
		L L L L L L L L	L L L L L L L L	L L L L L L H L	L 2
		L L L L L L L L	L L L L L L L L	L L L L L L H H	L 3
		L L L L L L L L	L L L L L L L L	L L L L L H L L	L 4
		:	:	:	L5… L252
		L L L L L L L L	L L L L L L L L	H H H H H H L H	L243
		L L L L L L L L	L L L L L L L L	H H H H H H H L	L254
	Blue	L L L L L L L L	L L L L L L L L	H H H H H H H H	Blue L255
Gray Scale of White & Black	Black	L L L L L L L L	L L L L L L L L	L L L L L L L L	L 0
	Dark ↑ ↓ Light	L L L L L L L H	L L L L L L L H	L L L L L L L H	L 1
		L L L L L L H L	L L L L L L H L	L L L L L L H L	L 2
		L L L L L L H H	L L L L L L H H	L L L L L L H H	L 3
		L L L L L H L L	L L L L L H L L	L L L L L H L L	L 4
		:	:	:	L5… L252
		H H H H H H L H	H H H H H H L H	H H H H H H L H	L253
		H H H H H H H L	H H H H H H H L	H H H H H H H L	L254
	White	H H H H H H H H	H H H H H H H H	H H H H H H H H	White L255

1999-4-26(Ver.0.3)

⚠ FOR SAFETY

LCD module is generally designed with precise parts to achieve light weighted thin mechanical dimensions.
In using our Modules, make certain that you fully understand and put into practice the warnings and safety precautions detailed in Engineering Information No.EE-N001,"CAUTIONS AND INSTRUCTIONS FOR TOSHIBA LCD MODULES".
Refer to individual specifications and TECHNICAL DATA sheets (hereinafter called "TD") for more detailed technical information.

1) SPECIAL PURPOSES

A) Toshiba's Standard LCD Modules have not been customized for operation in extreme environments or for use in applications where performance failures could be life-threatening or otherwise catastrophic.

B) Since Toshiba's Standard LCD Modules have not been designed for operation in extreme environments, they must never be used in devices that will be exposed to abnormally high levels of vibration or shock which exceed Toshiba's published specification limits.

C) In addition, since Toshiba Standard LCD Modules have not been designed for use in applications where performance failures could be life-threatening or catastrophic, they must never be installed in aircraft navigation control systems (such as, but not limited to Traffic Collision Avoidance System and Air Traffic Indicator), in military defense or weapons systems, in critical industrial process-control systems (e.g., those involved in the production of nuclear energy), or in critical medical device or patient life-support systems.

2) DISASSEMBLING OR MODIFICATION

DO NOT DISASSEMBLE OR MODIFY the module. It may damage sensitive parts inside LCD module, and may cause scratches or dust on the display.
Toshiba doses not warrant the module, if customer disassembled or modified it.

3) BREAKAGE OF LCD PANEL

DO NOT INGEST liquid crystal material, DO NOT INHALE this material, and DO NOT CONTACT the material with skin, if LCD panel is broken and liquid crystal material spills out.
If liquid crystal material comes into mouth or eyes, rinse mouth or eyes out with water immediately.
If this material contact with skin or cloths, wash it off immediately with alcohol and rinse thoroughly with water.

4) GLASS OF LCD PANEL

BE CAREFUL WITH CHIPS OF GLASS that may cause injuring fingers or skin, when the glass is broken.

5) ELECTRIC SHOCK

DISCONNECT POWER SUPPLY before handling LCD module.
DO NOT TOUCH the parts inside LCD module and the fluorescent lamp's connector or cables in order to prevent electric shock, because high voltage is supplied to these parts from the inverter unit while power supply is turned on.

6) ABSOLUTE MAXIMUM RATINGS AND POWER PROTECTION CIRCUIT

DO NOT EXCEED the absolute maximum rating values under the worst probable conditions caused by the supply voltage variation, input voltage variation, variation in parts' constants, environmental temperature, etc., otherwise LCD module may be damaged.
Employ protection circuit for power supply, whenever the specification or TD specifies it.
Suitable protection circuit should be applied for each system design.

7) DISPOSAL
When dispose LCD module, obey to the applicable environmental regulations.

1999-4-26(Ver.0.3)